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EXAMINER

KIM, DAVID S

ART UNIT

PAPER NUMBER

2633

DATE MAILED: 10/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/881,448

Applicant(s)

MISHRA, MANAV

Examiner

David S. Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 July 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 and 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Drawings

1. The drawings are objected to because of minor informalities:

In Fig. 8, box 806, "FROM TO" is used where "FROM THE FIRST INTERMEDIATE NODE TO" may be intended.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect may be deferred until after the examiner has considered the proposed drawing correction. Failure to timely submit the proposed drawing correction will result in the abandonment of the application.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 1-6** are rejected under 35 U.S.C. 102(e) as being anticipated by Chang (U.S. Patent No. 6,111,673).

Regarding claim 1, Chang teaches:

a method for provisioning bandwidth in a hybrid network (fig. 2), comprising:

assigning a set of switching wavelengths (Wp, Wa) to traffic in the network;

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optically switching traffic that is able to be switched using switching wavelengths between nodes using the set of switching wavelengths (fig. 2: 123, 121, 122, 201, 203);

assigning a set of routing wavelengths (col. 8, lines 20-43; col. 16, lines 29-45) to traffic that cannot be switched using switching wavelengths; and

routing the traffic that cannot be switched using the routing wavelengths (col. 8, lines 20-43; col. 16, lines 29-45).

Regarding claim 2, Chang teaches:

The method of claim 1, further comprising:

identifying critical nodes in the network;

establishing at least one static path between the identified critical nodes; and

optically switching traffic on the static path using the set of switching wavelengths

(see fig. 5, col. 11- line 5 to col. 12- line 23).

Regarding claims 3, Chang teaches:

The method of claim 1, further comprising:

dynamically selecting a path for traffic flow (col. 7- lines 17-33);

signaling downstream nodes in the path to establish and maintain the selected path for a predetermined time period (col. 7- lines 17-33, fig. 2 –NC & M 220—, fig. 5, col. 11- line 5 to col. 12- line 23).

releasing the selected path after the predetermined time period elapses (col. 7- lines 27-33).

Regarding claim 5, Chang teaches:

The method of claim 1, further comprising:

statically assigning a set of switching wavelengths to traffic in the network; and

optically switching the traffic between nodes using the set of switching wavelengths (col. 11- lines 47- 65).

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Regarding claim 6, Chang teaches:

The method of claim 1, further comprising:

dynamically assigning a set of switching wavelengths to traffic in the network (col. 11- line 5 to col. 12- line 23); and

optically switching the traffic between nodes using the set of switching wavelengths (fig. 5).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 7, 11, 13, 15, and 17-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghani ("Lambda-labeling: A Framework for IP-over-WDM using MPLS").

Regarding claim 7, Ghani teaches:

A method for sharing bandwidth in a hybrid network, comprising:

labeling traffic to be switched in the network with a set of switching wavelengths;

labeling traffic to be routed in the network with a set of routing wavelengths;

optically switching the traffic labeled with switching wavelengths; and

routing the traffic with routing wavelengths (see fig. 14—for a more legible copy of figure 14, see identical figure in Ghani - "Integration Strategies for IP over WDM", figure named "Hybrid Fiber-Wavelength-Packet (FWP) Node").

Ghani does not specifically teach:

routing the traffic with routing wavelengths if the traffic labeled with switching wavelengths cannot be optically switched.

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However, Ghani also teaches the sharing of resources among different routes (p. 600, last paragraph). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to perform said routing. One of ordinary skill in the art would have been motivated to do this to improve network spare capacity utilization (p. 53, last paragraph). That is, if the resources for switching cannot switch the traffic, the resources for routing could do so to complete the traffic transmission.

Regarding claim 11, Ghani teaches:

The method of claim 7, further comprising:

routing the traffic labeled with routing wavelengths using Open Shortest Path First (OSPF), Resource Reservation Protocol (RSVP), or Border Gateway Protocol (BGP) (see page 51- top of 2nd column).

Regarding claim 13, Ghani teaches:

The method of claim 7, further comprising:

labeling traffic to signal and transfer control information updates in the network with a set of control wavelengths (fig. 13 and section 3.5); and

exchanging routing updates using the set of control wavelengths (control wavelengths are conventionally used for routing updates).

Claims 15 and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Ghani.

Regarding claim 15, Ghani teaches:

An apparatus to communicate in a hybrid network, comprising:

switching logic to optically switch traffic carried on a set of switching wavelengths (fig. 14- “fiber LSP level”, the lowest level, and “wavelength switching level”, the second level),

routing logic coupled to the switching logic to route traffic carried on a set of routing wavelengths (fig. 14- “packet switching level”, the top level in the figure);

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control logic coupled between the switching logic and the routing logic for receiving information carried on a set of control wavelengths to determine whether traffic is to be directed to the switching logic or the routing logic (section 3, 3.1, 4, and fig. 13- top diagram).

Ghani does not specifically teach:

determining whether *all* traffic is to be directed to the switching logic or *a portion of the traffic that cannot be directed to the switching logic is to be directed to the routing logic.*

However, it is well known in the art that “[c]ircuit switched networks are generally regarded as high-speed and there is certainty that information will reach its intended destination” (application, p. 3, lines 6-7) and that routing is slow and lacks a guarantee that a packet will reach its intended destination (application, p. 2, lines 24-26). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to determine whether or not *all* traffic is to be directed to the switching logic. One of ordinary skill in the art would have been motivated to do this to try to take advantage of the speed and integrity of circuit switched networks (application, p. 3, lines 6-7) before resorting to the alternative of routing with its slower speed and lower integrity (application, p. 1, lines 24-26).

Additionally, Ghani also teaches the sharing of resources among different routes (p. 600, last paragraph). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to determine whether or not *a portion of the traffic that cannot be directed to the switching logic is to be directed to the routing logic.* One of ordinary skill in the art would have been motivated to do this to improve network spare capacity utilization (p. 53, last paragraph). That is, if the resources for switching cannot switch the traffic, the resources for routing could do so to complete the traffic transmission.

Regarding claim 17, it is inherent to the operation of the nodes shown in figures 13 and 14, that the logic assigns a set of routing wavelengths to a portion of the traffic in the network; and routes the portion of the traffic between nodes using the set of routing

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wavelengths. This is because certain wavelengths are dropped to the packet-switching level in figure 14. Also see section 3.1.

Regarding claim 18, Ghani teaches logic statically assigning a set of switching wavelengths to traffic in the network; and optically switching the traffic between nodes using the set of switching wavelengths (sections 3, 3.1, 3.3).

Regarding claim 19, Ghani teaches logic dynamically assigning a set of switching wavelengths to traffic in the network; and optically switching the traffic between nodes using the set of switching wavelengths (sections 3.1, 3.2).

Regarding claim 20, Ghani teaches:

A hybrid communications network, comprising:

a first hybrid node (fig. 14) to label switched traffic with a set of switching wavelengths (“wavelength switching/conversion matrix”), to send the switched traffic to at least one secondary hybrid node via the set of switching wavelengths, to label traffic with a set of routing wavelengths (fig. 14- see “WDM inputs from laser interfaces on routers” to “wavelength switching/conversion matrix”), to send the traffic to the at least one secondary hybrid node via the set of routing wavelengths; and

at least one secondary hybrid node (also exemplified by fig. 14) coupled to the first hybrid node (see figs. 9 and 11) to receive the switched traffic on the set of switching wavelengths and routed traffic on the set of routing wavelengths, to route the routed traffic using an Internet Protocol (IP), asynchronous transport mode (ATM) or frame relay (see top of page 47), and to optically circuit switch the switched traffic and the routed traffic to another secondary node (see “Wavelength switching/conversion matrix”).

Ghani does not specifically teach:

attempting to send the switched traffic to at least one secondary hybrid node via the set of switching wavelengths;

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labeling traffic that cannot be sent to the at least one secondary hybrid node using the set of switching wavelengths with a set of routing wavelengths; and

sending the traffic that cannot be sent to the at least one secondary hybrid node using the set switching wavelengths to the at least one secondary hybrid node via the set of routing wavelengths.

However, it is well known in the art that “[c]ircuit switched networks are generally regarded as high-speed and there is certainty that information will reach its intended destination” (application, p. 3, lines 6-7). It is also well known in the art that routing is slow and lacks a guarantee that a packet will reach its intended destination (application, p. 2, lines 24-26). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to perform said attempting. One of ordinary skill in the art would have been motivated to do this to try to take advantage of the speed and integrity of circuit switched networks (application, p. 3, lines 6-7) before resorting to the alternative of routing with its slower speed and lower integrity (application, p. 1, lines 24-26).

Additionally, Ghani also teaches the sharing of resources among different routes (p. 600, last paragraph). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to perform said labeling and sending in the case that said attempting fails. One of ordinary skill in the art would have been motivated to do this to improve network spare capacity utilization (p. 53, last paragraph). That is, if the resources for switching cannot switch the traffic, the resources for routing could do so to complete the traffic transmission.

Regarding claim 21, the first and secondary hybrid nodes comprise a wavelength network element, an optical cross-connect, an optical network element, an optical switch, a lambda switch, a lambda network element, or a wavelength translator (see “multi-fiber spatial switch” and “wavelength switching/conversion matrix”).

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7. **Claims 8-10 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghani, as applied to claim 7 above, and further in view of Nishimoto (U.S. Patent Application Publication 2001/0024305 A1).

Regarding claim 8, Ghani does not specifically teach:

The method of claim 7, further comprising:

optically switching the traffic labeled with switching wavelengths using optical circuit switching; and

routing the traffic labeled with routing wavelengths using Internet Protocol (IP) routing.

However, Nishimoto teaches an optical node device that provides such switching and routing (See p. 5- [0113] to [0115]). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to improve the method of Ghani by incorporating the optical node device teachings of Nishimoto. One of ordinary skill in the art would have been motivated to do this since it has a low cost, simple configuration, and high expandability (Nishimoto, p. 2, [0016]).

Regarding claim 9, Ghani in view of Nishimoto teaches:

The method of claim 8, further comprising:

converting the traffic labeled with routing wavelengths to an electrical domain

(Nishimoto, 15 in fig. 12);

processing the traffic labeled with routing wavelengths in the electrical domain

(Nishimoto, 18); and

converting the traffic labeled with routing wavelengths back to the optical domain from the electrical domain (Nishimoto, 16).

Regarding claim 10, Ghani in view of Nishimoto teaches:

The method of claim 7, further comprising:

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optically switching the traffic labeled with switching wavelengths using a wavelength network element, an optical cross-connect, an optical network element, an optical switch, a lambda switch, a lambda network element, or a wavelength translator (Nishimoto, 18).

Regarding claim 12, Ghani in view of Nishimoto teaches:

The method of claim 7, further comprising:

routing the traffic labeled with routing wavelengths using an Internet Protocol (IP), asynchronous transport mode (ATM), or frame delay (Nishimoto, page 5- [0114]).

8. **Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ghani as applied to claim 7 above, and further in view of Chang.

Ghani does not specifically teach:

The method of claim 7, further comprising:

labeling traffic to signal and transfer control information updates in the network with a set of control wavelengths;

appending labeling information on routing updates;

exchanging routing updates and labeling information using the set of control wavelengths; and

generating a label map from the routing updates and labeling information.

Chang teaches these features in a hybrid network (Chang, fig. 4, col. 11- lines 14-60). At the time the present invention was made, it would have been obvious to one having ordinary skill in the art to use routing wavelengths to update routing and labeling information, as taught by Chang, in the method of Ghani. One having ordinary skill in the art would have been motivated to do this in order to render the nodes in Ghani reconfigurable (by use of the control wavelengths), thus allowing for more versatile communications by changing path assignments based on network needs.

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9. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ghani as applied to claim 15 above, and further in view of Chang. Ghani teaches the logic further to

dynamically select a path for traffic flow (section 3.2);
signal downstream nodes in the path to establish and maintain the selected path;
optically switch traffic on the selected path using the set of switching wavelengths; and
release the selected path.

Ghani does not specify setting up the path for a predetermined amount of time. Chang teaches setting up a wavelength path for a predetermined amount of time, after which the path is released (Chang, col. 7- lines 17-33). At the time the present invention was made, it would have been obvious to one having ordinary skill in the art to set up a wavelength path for a predetermined amount of time, after which the path is released. One having ordinary skill in the art would have been motivated to do this in the case of bursty traffic, in order to accommodate a burst of traffic, and then to return the network to its original configuration.

10. **Claims 22 and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghani as applied to claim 20 above, and further in view of Chang.

Regarding claim 22, Ghani teaches the hybrid nodes comprising logic to receive routing updates and label information via a set of control wavelengths. Ghani does not specifically teach generating a label map from the routing updates. Chang teaches a hybrid system, wherein the hybrid nodes use information via a set of control wavelengths to generate a label map from the routing updates (Chang, fig. 4). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the network of Ghani with the generating teaching of Chang. One of ordinary skill in the art would have been motivated to do this to generate the switching matrix that provides the shortest path (Chang, col. 16, lines 61-64).

Regarding claim 23, the first and secondary hybrid nodes each further comprise logic to store routing (Chang, 410).

Response to Arguments

11. Applicant's arguments with respect to claims 1-3 and 5-23 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 703-305-6457. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

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DSK



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